Storm Controls Ltd.

1, Tennant Avenue,
College Milton South,
East Kilbride G74 5NA
SCOTLAND
Tel: (44) (0) 1355 571781
e-mail: sales@stormcontrols.co.uk
web site: stormcontrols.co.uk

QUALITY ACCREDITATION TO ISO 9001:2008

URS is a member of Registrar of Standards (Holdings) Ltd.

ALL RIGHTS RESERVED
Storm Controls Ltd. Reg. Office 1, Tennant Avenue, College Milton South. East Kilbride G74 5NA SCOTLAND

Storm Controls Ltd. reserve the right to make improvements in the product described in this manual at any time without notice. Storm Controls Ltd. cannot accept liability for any damages or loss of information resulting from the use of information in this document.

CE Approved

CAD REF = R-TYPE MANUAL .PUB
VERSION 6 15/12/2014

© SCL 2009-2014

Storm Controls LIMITED

APPROVED PRODUCT E11 10R-048411

R-TYPE

In Cab Temperature Recorder

User & Installation Manual

QUALITY ACCREDITATION TO ISO 9001:2008

URS is a member of Registrar of Standards (Holdings) Ltd.

CONTENTS

	Page
1. Introduction	2.
2. General Description	3.
3. Important Information	3.
4. First Switch On	4.
5. System Set Up	5.6,7,8.
5. Scrolling Types	9
6. Delivery & Journey Ticket Types	9,10
7. Installation Guide	10,11
8. Wiring Diagrams & Fitting Instructions	12
9. Printer Paper & Ribbon replacement R-Type	13
10. Fault Finding & Replacement parts	14
11. Read me	15

1. Introduction

Congratulations on buying an R-Type Recorder Model SM6R we are sure that it will give you a long and trouble free service.

Your Recorder has been Designed & Manufactured under stringent BSI ISO 9001:2008 accredited Quality procedures and processes using the latest automatic assembly techniques and technology.

This Recorder also meets the latest European Vehicle Regulations ECC 10.4:2011. Annex 7,8 and 10 and has VCA E11 Certification. Certification No. 10R-048411

SM6R Recorders accept between 1 and 6 temperature sensor inputs, plus 2 door switch inputs, and 2 defrost inputs. 10 inputs in total plus 1 Alarm Output.

Temperature is stored in memory, displayed and printed in degrees Celsius.

READ ME

DISLAY IN FORMATION FOR DOOR OPENS & DEFROSTS

Scrolling Software Types

On scrolling types the information on the activation of the Door and Defrost are shown in words at the end of the normal sensor scan. So if there is say 4 sensors fitted then after the 4th sensor information is displayed the display screen clears and the “Door 1” or “Door 2” open caption will appear followed by the “Defrost 1 On” and “Defrost 2 On” caption (provided they are activated) after which the display reverts to displaying sensor 1 temperature , sensor 2 temperature etc..

Print (Delivery & Journey) Ticket Types:

On this version the Display instead of showing the status in words shows the status using symbols. After the last connected sensor information is displayed :

1. if any if the two doors are open then a “+” sign is shown on the extreme right of the screen on the top line.
2. if any if the two defrost are active then a “#” sign is shown on the extreme right of the screen on the bottom line.
3. If both a Door and Defrost are active at the same time the “+” Door symbol will show first followed by the “#” Defrost symbol.

Alarms

1. **On recorders displaying only one Temperature Channel at a time.**
Should an alarm occur the display will flash ‘ALARM’ at the appropriate channel on the display during its normal monitor cycle.

2. **On recorders displaying more than one Temperature Channel at a time.**
Should an alarm occur the display will display an “*” next to the Channel in alarm during its normal monitor cycle.

Fault Finding

Fault Description	Cure
Display blank	1: Check voltage to unit,. Volts should be DC and between 9 and 32 volts. If no power check 'in line fuse and cabling. 2. Check the polarity of the supply. The recorder is protected against reversed connections and will not power up. Check the positive side of the supply is on the +ve connector pin. See page 13. 3. Try switching off the power, wait for 20 seconds and then reconnect.
Sensor position displays & prints -39.9 (sensor open circuit)	1: Check if sensor connected. If not add sensor. 2: Disconnect sensor & measure resistance across leads (+20º=30kΩ, 0º= 100kΩ). If sensor reads open circuit (high value greater than 2Megohms) check for cut sensor cable. If sensor values ok, **unit appears faulty** check by fitting known good sensor.
Sensor position displays and prints 49.9 (short circuit sensor)	1: Disconnect sensor , unit should now read –39.9. 2: Check terminal block wires and screen cables are not shorted 3: Check recorder using known good sensor, if unit ok replace with full length new sensors or use Storm's Sensor repair kit.
Unit shows -39.9 in unused Channels or does not show sensors in used Channels .	**The unit needs initialised.:** Enter the Program Menu by pressing the two "up/ down" keys simultaneously and release. At "1. EXIT" on the display, press the ENTER key to exit the menu. During the recorder's return to the RUN mode it will scan the connected sensors , initialise and resolve these problems, provided the required number of good sensors remain connected during this procedure. **Always use the lowest numbered sensor positions on the terminal block.** For example : For 1 sensor use position S1 for 2 sensors use positions S1,S2, for 3 sensors use S1,S2,S3 for 4 sensors use S1,S2,S3,S4 etc **Note: The recorder assumes that there will always be at least one sensor fitted. If no sensors are fitted the recorder will operate as though there was 1 sensor fitted and show -39.9 (open circuit) on Channel 1.**

Replacement parts

R unit

Sensor repair kit	HS10/150-RKIT
Paper roll x 10	User Kit 2R
Printer Ribbon x 5	User Kit 4R
Recorder units	Factory repair only

3. General Description

Storm R-Type Temperature Recorder comes complete with Display & Printer. It accepts up to 6 sensors as inputs, 2 door switch inputs and 2 defrost inputs. An external alarm can be connected to the recorder using the alarm output connections provided on the terminal block.

Main Features :

* Programmable Sample Rates from 1-60 minutes.
* "Print Back From" Feature.
* RS232 communications port.
* Alarm Delay Setting 0-59 min.
* Regular paper printout (not special thermal paper)
* *Alpha-numeric 16 x 2 LCD backlit display .
* Selectable in 7 languages (If language module loaded).
* *Full user set up using keyboard access menu.

The R-Type Recorder has an IP40 rating & designed for installation in the Driver's cabin .

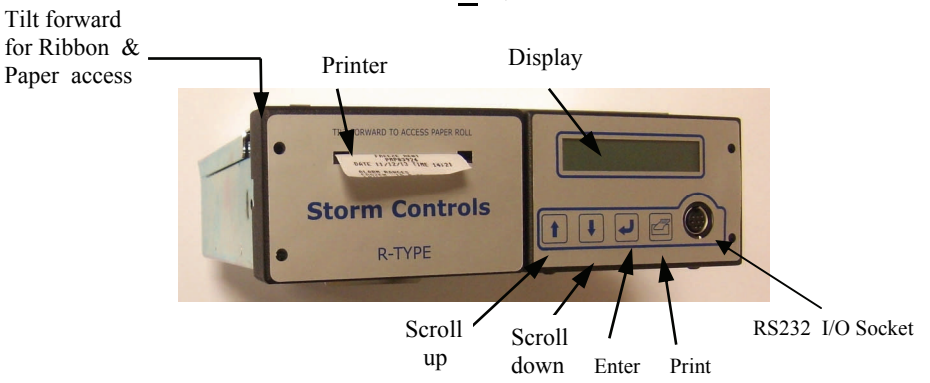
3. Important Information

R-TYPE RECORDERS ARE DESIGNED FOR INTERNAL APPLICATIONS

The following advice must be followed at all times.
Failure to do so may invalidate the recorder warranty:

* Make sure you disconnect the vehicle battery before starting any alterations to the circuit wiring.
* The unit warranty does not allow for users tampering with the unit or gaining access to the internal printed circuit board or components of the unit.
* Remember to seal any cable entries made through the vehicle body with a suitable water proof sealant in order to ensure that water does not get into the vehicle or recorder interior.
* Only qualified and Storm approved personnel should attempt to carry out repairs or alterations to the unit or its firmware.
* See warranty card for details of warranty returns procedure.

R-Type Recorder Model SM6R



4. FIRST SWITCH ON

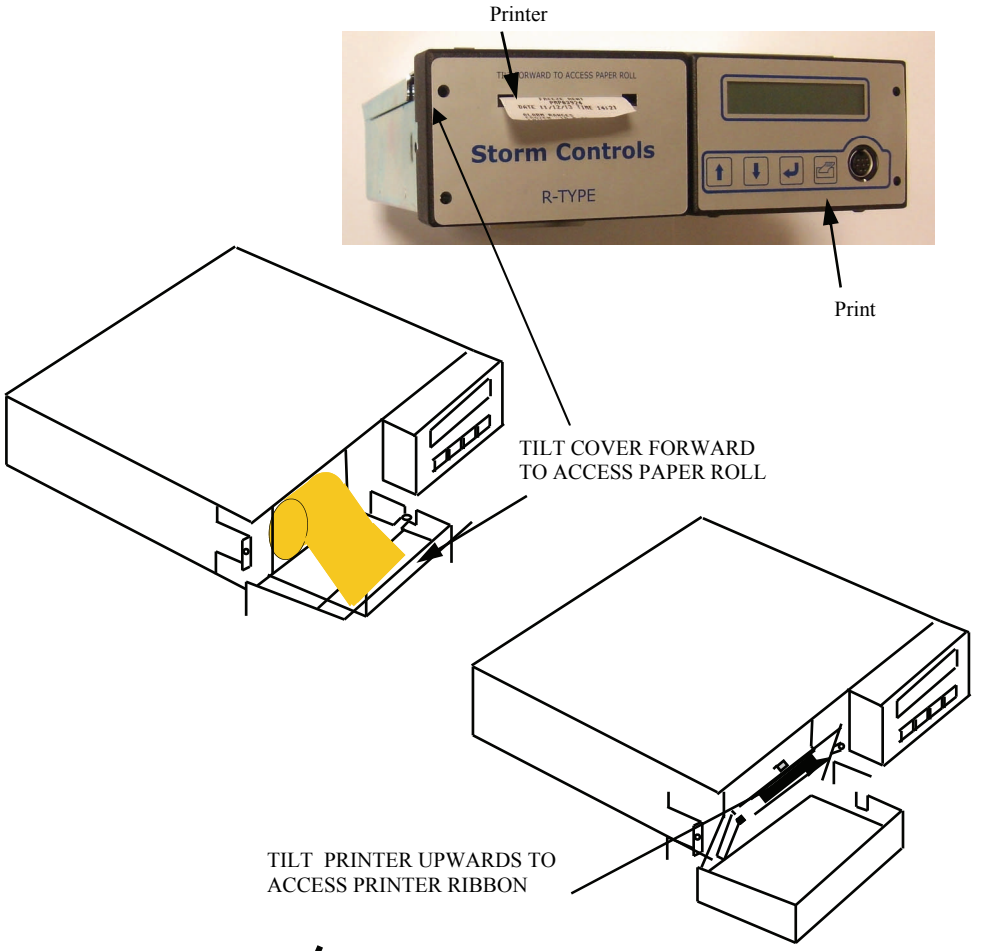
After the installation wiring is complete switch on the unit by connecting to the battery for the first time. Follow the simple procedures outlined below to get your recorder up and running and to allow it to identify your installation configuration.

1. Power up the unit. The recorder initialises and displays various parameters as it boots up and after a short delay the display shows Date and Time, and then begins to cycle round the sensor probes, in turn, showing the temperature being sensed by each one. After the connected sensors have been displayed, the Time and Date are shown and the recorder continues to follow this sequence. The recorder is fully operational at this stage and will use the pre-set default parameters as set at the factory.
As part of the recorders initialising procedure, the recorder counts the number of correctly connected sensors in your installation and uses this information to determine the format of future printouts and display details. The recorder remembers the last installation configuration it saw during the last power up initialisation. If in the future the number of sensors in your installation is changed, the recorder must be allowed to recalculate the sensor configuration to allow it to make the best use of the printer and display facilities.

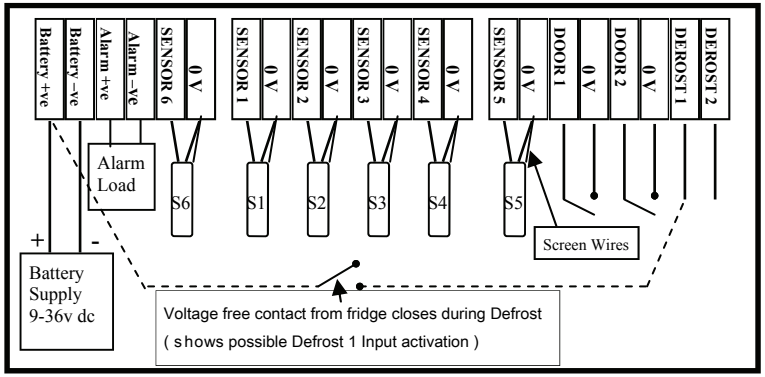
2. In order to allow the recorder to identify your altered installation after a sensor increase/decrease, simply press the two "**Up/Down"** keys ↑ ↓ simultaneously to take you into the programming menu. The message **"Logging Disabled "** will be shown on the display for a short period.Release the keys and you will automatically enter the "**Menu"** at the **"**1. **EXIT "** position.
3. When this happens press the " Enter " key ↵ and release. The unit will display "**Initialising** " then "**unit type & revision code**" . The instrument is now scanning your installation and checking for errors. When this is complete the unit will resume its normal mode of operation but this time it will show information pertaining to the new sensor configuration. If any sensor is connected but not shown as active it will be because it is not connected to the recorder correctly. Check the sensor circuit and ensure the wiring is correct and the sensor connection is not open circuit or shorted. Once any issues are sorted repeat the initialising routine from **"2 "** above. (Note: Open circuit sensors connections will show as –39.9 on the display and short circuit connections as +40. see also page 14.)
4. At boot up, some recorder versions will prompt for a password before you are allowed to enter the Program Menu. The password default is **1111** and the displayed characters can be changed by using the up/down ↑ ↓ keys to change the character highlighted by a cursor below the character. Next press the Enter key to accept the character and the cursor will highlight the next character. Enter all four characters in this manner. When the last character is accepted the display will change to **"1. Exit ".** You are now in the Menu. Resume initialisation as at "3. " above.
5. If the date and time shown on the display are not correct, for your time zone, set the time and date using the procedures outlined on Page 6 of this manual.
6. Providing you have followed the simple procedure detailed above the recorder unit is now fully operational.
You may wish to change some of the operational parameters to suit your own application. Procedures for accomplishing this are shown on Pages 5 through 8 of this manual.
For your information:
The resident default values in the units memory on delivery from the factory are listed below:

Language: *English*,
Vehicle Registration: *S00XXX* ,
Frozen Alarm Range : *-18C to –25C,*
Alarm Delay*: 15 minutes.*
Company Name: *Storm Controls,*
Sample rate: *15 minutes,*
Chilled Alarm Range: *+8C to 0C.*
Alarm Status: *Ch1-Ch6 set to OFF*

Paper & Ribbon Set-Up (R units)



SM6R-Wiring Diagram (R-Type)



Notes:

1. A dc voltage output is provided at the "Alarm+ve and Alarm-ve" terminals for use with driving external alarm circuits.
In an Alarm condition the "Alarm-ve" terminal switches to –ve Battery Volts whilst the *"Alarm+ve" terminal is maintained at +ve Battery Volts.* Use an Alarm Relay with Coil Operating Volts = Volts on battery input terminals. **For polarised coils with diode protection connect the positive end to "Alarm+ve"**

Maximum Permissible Alarm Terminal Load Current = 1A dc max

2. The "Defrost 1" and Defrost 2 inputs expect a positive input of 12 to 24 volts dc to be switched to the inputs to advise the recorder when the fridge unit is in defrost or the heater unit is active.
If there is not a suitable relay within the fridge, this may require the use of an external relay to provide this signal. A voltage fridge driven contact connected between battery volts and the Defrost input can be used.

Fitting Instructions

A cage fitting for in dash radio slot fixing is supplied with the kit and under-dash mounting kits are available to purchase from Storm's Sales Office.
Most recorders will have at least 2 sensor probes. Route the probes up the inside of the bulkhead adjacent to the unit frame using plastic trunking. Drill through the bulkhead using a 12mm drill and feed the probes through to the inside of the body.
Once the probes are inside, position the return air sensor as close to the fridge return air control sensor as possible, but not in the main airstream.
Run the air sensor probe down the body following the bulkhead to roof joint for 3/4 of the way down the fridge compartment. Then bring the probe out at a right-angle to the centre of the compartment and fix the sensor in the air flow from the evaporator.
Enclose both sensor cables with plastic trunking. It is envisaged the trunking and the probes will be fitted at the same time. Ensure that the probes cannot be damaged by being fitted in a position where goods or Carriers can cause mechanical damage.
Connect the recorder directly to the battery or other permanent supply position. The positive battery lead to be fused using the 3A fuse and holder supplied in the fitting kit. Fit the 3A fuse at the battery end of the cable. If the recorder is switched through the ignition switch, or other on/off source, remember the recorder does not record during periods when the power is removed, although the time and date will function correctly during these periods.

It is not good instrumentation practice to use the chassis to provide a negative return to the recorder. Instead run a separate negative lead back to the battery.

As previously intimated the R-type unit is for in cab use only and should not be fitted externally or in a position where fluids or other materials can enter the recorder since this may cause malfunction and nullify the warranty

5. SYSTEM SET-UP

Logging — Password

PARAMETERS MENU

1. EXIT
2. LANGUAGE ?
3. PRINT PROG. SETTINGS
4. COMPANY NAME
5. VEHICLE REGISTRATION
6. SET DATE
7. SET TIME
8. SAMPLE RATE
9. SET ALARM RANGES
10. CHANGE ALARM SETTINGS
11. SET ALARM DELAY
12. PRINT ALL DATA

Set the parameters of the recorder by entering the Program menu..
To do this Press the Up and Down keys together. The Display will show "1. Exit." This is the top of the parameter menu as shown on the left..

If a Password is required, please refer to Page 4 paragraph 4, use the procedure outlined in that section and return to this section once "1. Exit" appears on the display

Use the Up and Down keys to scroll to the option you wish to change.

Once the required parameter is displayed Press the Enter key to enter the required parameter option and make the change using the instructions detailed against this option.

5.2: Change Language

2. LANGUAGE ? — ENGLISH

Use this option to select 1of 7 languages. (If language module fitted)
Printouts and Display information will be converted to the selected language

Once the new Language is selected, Press the ENTER key to accept this information and return you once more to the Parameter menu.

5.4: Company

STORM CONTROLS

This option gives you the facility to print out your company name using up to 15 characters at the start of each data printout.

Use the up and down keys to scroll throughout the characters and numbers.

Press the enter key to accept and move to next character.
Note: It is necessary to move through the full 15 characters before the unit will accept the new Name. Use blanks as spaces if necessary

Once the new Name is set Press the ENTER key to accept this information and return you once more to the Parameter menu.

5.5: Vehicle Registration

This option gives you the facility to print out your vehicle registration number using up to 14 characters on your data printout. The set number is also used for identification of any uploaded stored data files when using a Ramlog, user Laptop or PC.

VA 1234

Press Enter to enter the Required function.

Use the up and down keys to scroll throughout the characters and numbers.

Press the enter key to accept and move to the next character. **Note**: It is necessary to move through the full 14 characters before the unit accepts the new Registration. Use blanks as spaces if necessary .

Once the new Registration No. is set Press the ENTER key to accept this information and return you once more to the Parameter menu.

5.6: Set Date

DATE 1: 1:98

Use the up,down and enter keys to set the current date. Date format: Day/Month/Year
Note: The recorder provides automatic compensation for Leap Years

Once the new date is set Press the ENTER key to accept this information and return you once more to the Parameter menu.

5.7: Set Time

TIME 12: 1:15

Use the up, down and enter keys to set the current time.
Note: The recorder provides an automatic winter/ summer one hour offset for European users

Once the new time is set Press the ENTER key to accept this information and return you once more to the Parameter menu.

5.8: Set Sample Rate (Time between recordings)

CURRENT

Use the up, down and enter keys to set the sample rate. {The sample rate is the time interval between the memory storage of each group recording versus time.(normally 15 mins).}

Note:
The temperature on each sensor is measured once every 10 seconds. When it comes time for the temperature and event information to be stored in memory 4 temperature readings are taken for each sensor and the average for each sensor stored in memory against time.

Once the new rate is set Press the ENTER key to accept this information and return you once more to the Parameter menu.

Before proceeding please ensure you read the following:-

- In accordance with normal good Engineering practice, ensure that recorder sensor cables are routed away from High Voltage cables and other cables such as Radio Antennas by a minimum of 30cm. Do not bundle sensor cables with those of other appliances.
- The sensor used for the return air should be located as close as possible to the fridge return air sensor, but not in the main air draft.
- Ensure that you fit the 3A in-line fuse. This should be connected directly to the battery, at the battery end, to ensure protection of the supply cable.
- Ensure that the sensor screens are connected to 0V as shown in the wiring diagram which is provided with the recorder.
- The recorder identifies the number of sensors that are connected only after the initialisation process has been performed. See Page 4 for details.
  If the recorder, for example, fails to see some sensor values or displays –40C in positions where no sensor is fitted, on first switch on, please remember this requirement
- If a sensor is not connected correctly or the cable is open circuit, the temperature display will show –40C and this value will be recorded.
- Exposed cables between the rear box chassis and the cab on rigid vans should be protected from chaffing using suitable split trunking.

READ ME

DISLAY IN FORMATION FOR DOOR OPENS & DEFROSTS

Scrolling Software Types

On scrolling types the information on the activation of the Door and Defrost are shown in words at the end of the normal sensor scan. So if there is say 4 sensors fitted then after the 4th sensor information is displayed the display screen clears and the “Door 1” or “Door 2” open caption will appear followed by the “Defrost 1 On” and “Defrost 2 On” caption (provided they are activated) after which the display reverts to displaying sensor 1 temperature , sensor 2 temperature etc..

Print (Delivery & Journey) Ticket Types:

On this version the Display instead of showing the status in words shows the status using symbols. After the last connected sensor information is displayed :

1. if any if the two doors are open then a “+” sign is shown on the extreme right of the screen on the top line.
2. if any if the two defrost are active then a “#” sign is shown on the extreme right of the screen on the bottom line.
3. If both a Door and Defrost are active at the same time the “+” Door symbol will show first followed by the “#” Defrost symbol.

Delivery Ticket

A "delivery ticket" shows the temperature for each sensor at the instant the delivery ticket is being printed. The information does not derive from the memory.

STORM CONTROLS
1234567890
Date 18/ 1/ 14
Time 10:30

DELIVERY TICKET

Current Values

S1	S2	S3	S4
-20.0	-10.0	-5.0	+10.0
S5	S6		
-8.0	+16.0		

SIGNED ……...

Journey Ticket

A "journey ticket" shows the temperature for each active sensor, from the information stored in recorder memory against time starting with the most recent recording and moving backward in time and date.

The stored information is added to as each sample rate time expires.

If the sample rate is 15 minutes then a new set of records will be added to the memory and hence the top of the journey ticket reading print out every 15 minutes.

PRINT Print Key

STORM CONTROLS
1234567890
Date 18/ 1/ 14
Time 10:45

JOURNEY TICKET

Recording every 15 mins
Alarm Settings:-
Frozen -18.0 / -25.0
Chilled 8.0 / 0.0

DATE 18 / 2 / 1
TIME 10:40

S1	S2	S3	S4
20.0	-9.7	-5.0	-20.0
S5	S6		
-9.7	-5.0		

TIME 10:25

S1	S2	S3	S4
20.0	-9.7	-5.0	-20.0
S5	S6		
-9.7	-5.0		

TIME 10:10

S1	S2	S3	S4
20.0	-9.7	-5.0	-20.0
S5	S6		
-9.7	-5.0		

Journey Start 6:00

SIGNED ……..

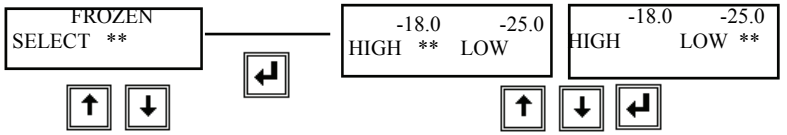
INSTALLATION GUIDE

Open the recorder box and inspect the

ITEMS	QUANTITY
Sensors Lengths as Supplied	2
Power Supply Cable	1
Printer Paper Roll	1
Fuseholder & 3A fuse	1
User Connector 6 way	1
User Connector 8 way	2
R-Type User Manual	1

5.9: Set Alarm Ranges

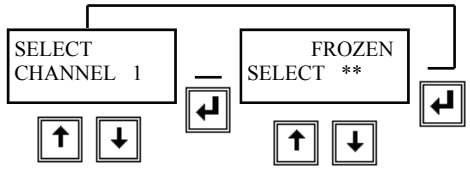
Select Frozen or Chilled — Adjust High and Low Limits



The Recorder has 3 alarm levels namely **Frozen,Chilled and OFF**.

5.10: Change Alarm Settings

Select the channel — Change to Frozen

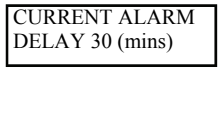


This function is used to assign each channel alarm to Frozen, Chilled or Off.

Please note that this function is also available in the **Run Mode** by pressing **Enter**.

Exit from the set-up loop using this command.

5.11. Set Alarm Delay



Use the up, down and enter keys To set the alarm delay. The alarm Delay is the time that an error has to be active before it is treated as an alarm.

5.12: Print All Data & Print Back From

Select Item 12. on Menu "Print all data" by pressing the ENTER key.

The display will show the start and end dates stored in the memory.
For example: From 29/05/07
To 29/08/07
PRINT ALL DATA
If a print out of the whole memory is required simply press the ENTER key 3 times to step through the "From" date without changing the initial "From" date. Press the ENTER key again and the recorder will begin to print out the whole of the data held in memory.

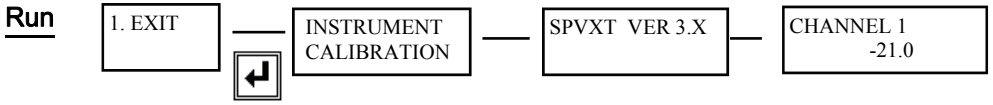
PRINT BACK FROM
To print back from a selected part of the data stored in memory press the ENTER key once to select the Day Setting function and use the
Up/Down keys to set the Day number.
Once the Day is set press the ENTER key to enter the Month setting and repeat the
Same procedure to set the required Month and Year.
After the Year is set press the ENTER key again to start the print.

Portion of Typical Printout

```
DATE: 18:11:14
VEHICLE:  J123ABC

RECORDING EVERY 15m

ALARM SETTINGS:-
FROZEN  -18.0 / 25.0
CHILLED  18.0 / 0.0
……..
CH 1  CHILLED
CH 2  FROZEN
CH 3  OFF
CH 4  OFF
12.25
S1      S2      S3      S4
12.2    -1.8    -8.9    7.5
12.40
S1      S2      S3      S4
12.2    -1.7    -8.6    7.0
12.55
S1      S2      S3      S4
12.3    -1.8    -8.6    7.0

SIGNED……
```

To STOP the print at any time, wait until at least 4 lines with temperatures have been printed then press and hold down the ENTER key until the printing stops and then release the return button. The printer will start up again and print out the "Signed ……." line and then stop completely.

Once the required printing is complete the display will show 1. Exit. Press the ENTER key to exit the menu. The unit will initialise, show the firmware revision number and then revert to normal Operation showing temperatures and times.



To return to the RUN MODE select option 1. (EXIT) and press Enter.

The recorder will perform an auto-calibration, detect which sensors are connected to it then display unit type & software version.

The system will then cycle and display all installed sensor temperatures as it monitors and records them with time

NOTE:- THE DISPLAY LAYOUT MAY VARY BETWEEN MODELS

Scrolling Software Printout Types

Units with Scrolling software printouts are designed mainly for the long haul multi day trip market.
When the PRINT button is pressed, the unit prints out continuously either until:
1. the PRINT button is pressed & held again until the print stops. Releasing the button will allow the unit to print the "Signed Line" and then stop. or
2. If the print button is not pressed to stop the print the printout will continue to until the time and date that the Program Mode was last entered on the recorder. This enables long trips to be monitored by entering the program mode then immediately exiting to the normal run mode to set the trip start.

The example to the right gives a typical printout with scrolling software.

```
FRONT PANEL TEST
VEHICLE OSN5405
DATE 23/ 03/ 14

 RECORDING EVERY 30 mins
ALARM SETTINGS :-
 FROZEN  -18.0 /-25.0
 CHILLED 8.0   /0.0
……..

DATE   10/ 1/07
TIME 17:00
    S1      S2      S3      S4
 -20.3    -9.6     1.0    12.2
    S5      S6
  19.5    31.9
TIME 16:30
    S1      S2      S3      S4
 -20.3    -9.6     1.0    12.2
    S5      S6
  19.5    31.9
TIME 16:00
    S1      S2      S3      S4
 -20.3    -9.6     1.0    12.2
    S5      S6
  19.5    31.9
TIME 15:30
    S1      S2      S3      S4
 -20.3    -9.6     1.0    12.2
    S5      S6
  19.5    31.9
INITIAL ALARM SETTINGS
CH. 1    OFF
CH. 2    OFF
CH. 3    OFF
CH. 4    OFF
CH. 5    OFF
CH. 6    OFF

SIGNED……..
```

Print (Delivery & Journey) Ticket Types

Recorders with Delivery & Journey ticket style printout software are designed mainly for the short haul multi-delivery market.

In RUN mode there are 2 modes of Printing, Delivery Ticket mode & Journey Ticket mode.

When the "Print" key is pressed the display will show "Delivery Ticket" .
If the "Print" key is not pressed again, after a short delay the recorder will print out a "Delivery Ticket". As shown below.
If the "Print key is pressed for a second time, immediately after the first "Print" key press the Display will change to "Journey Ticket" and immediately start printing the "Journey Ticket". See a portion of a "Journey Ticket" below.
A "Journey Ticket" prints out a maximum " of 24 hours of stored data starting from the time the "Journey Ticket" was requested. If 24 hours worth of readings is not yet stored in memory, the "Journey Ticket" will stop printing at the end of the stored readings.
THE JOURNEY TICKET PRINTING CAN BE STOPPED AT ANY TIME.
Simply wait until a few temperature readings are printed out and then press the "Print" key and hold down. After a short time the printing will cease. Release the key and the printing will start up again, print out the "Signed ……." line and stop.